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THE WORK OF USSR SCIENTISTS ON FERROMAGNETISM

Ye. I. Kondoraskiy

The following information has been extracted. Abbreviations used are: ATE (Auto and Tractor Electrical Equipment Plant, Moscow), PTI (Physicotechnical Institute), GIFTI (State Institute for Physicotechnical Research ?), LFPI (Leningrad Physical Technical Institute), MGU (Moscow State University), NIIIF (Scientific Research Institute of Physics ?), Fizmashinmet (Central Scientific Research Institute of Ferrous Metallurgy), TNIIT Mash (Central Scientific Research Institute of the Technology of Machine Building), TsZL (Central Factory Laboratory), UFAN (Ukrainian Affiliate of the Academy of Sciences), VRI (All-Union Electrotechnical Institute), and VIAM (All-Union Institute of Aviation Materials);

INTRODUCTION

"The author considered his task to be the description of the main work done by our scientists on the study and explanation of the basic phenomena of ferromagnetism."

I. WORK ON THE CAUSES OF FERROMAGNETISM

Name	Year	Institution	Subject
Ya. G. Dorfman	1927	LFPI	Deviation of beta-particles in ferromagnetic bodies
Ya. I. Franks'	1928	LFPI	Spontaneous magnetization can be caused by reactions between electrons

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Name	Year	Institution	Subject
Kaner	1940	IPTI	Examination of three-dimensional spin lattices from standpoint of quantum mechanics
P. L. Kapitza	1929		Quantum theory of ferromagnetism
Komar	1941		Binary ferromagnetic alloys (with Vol'kenshteyn)
S. P. Shubin	1954	UFAN	Polar model in multielectron treatment of a crystal (with Vonsovskiy)
Stil'bans	1959	IPTI	Approximate calculation for three-dimensional spin lattices
Vol'kenshteyn	1941		Binary ferromagnetic alloys (with Komar)
S. V. Vonsovskiy	1955	UFAN	Polar model in multielectron treatment of a crystal (with Shubin)
S. V. Vonsovskiy	1940		Theory of three-dimensional spin lattices Extension of Geisenberg-Bloch theory to binary ferromagnetic alloys Showing relation between Curie Point and composition of the alloy

II. WORK ON MAGNETIC ANISOTROPY AND STUDY OF PROPERTIES
AND THEORY OF FERROMAGNETIC CRYSTALS

M. S. Akslov	1928	Calculation of energy of uniform deformation of a dipolar lattice
M. S. Akslov	1929	Relation between free energy of undeformed lattice and direction of magnetization vector
M. S. Akslov	1930	Magnetic structure of polycrystalline bodies
M. S. Akslov	1931	Magnetization curves of cubical system crystals. Formula for magnetization curves of iron approaching saturation

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<u>Name</u>	<u>Year</u>	<u>Institution</u>	<u>Subject</u>
N. S. Akhlov	1932	MGU	Method of determining anisotropic constant by measuring torsional moment acting on a disc in a magnetic field (with Bryukhatov)
N. S. Akhlov	1933		Hysteresis curves of an ideal crystal
N. S. Akhlov	1934		Galvano- and thermo- magnetic and elastic effects during magnetization
K. P. Belov	1935	MGU	Influence of elastic strains on conductivity, thermal EMF, and magnetic structure of ferromagnetics
N. L. Bryukhatov	1932	MGU	Method of determining anisotropic constant by measuring torsional moment acting on a disc in a magnetic field (with Akhlov)
N. L. Bryukhatov	1937	MGU	Relation between anisotropic constant of nickel and temperature (with Kirenskiy)
N. V. Dekhtyar	1938	MGU	Anisotropy of susceptibility of iron crystals and its dependence on elastic strains
G. P. D'yakov	1941	MGU	Influence of elastic strains on conductivity, thermal EMF, and magnetic structure of ferromagnetics
D. P. Fedensov	1935	MGU	Influence of elastic strains on conductivity, thermal EMF, and magnetic structure of ferromagnetics
M. A. Grabovskiy	1939	MGU	Magnetization curves of nickel wires at various temperatures and tensions
A. S. Kachkov	1940		Magnetic texture of specimens annealed in a state of strain (with Shur)
Kirenskiy	1937	MGU	Relation between anisotropic constant of nickel and temperature (with Bryukhatov)
P. P. Krasnov	1934	MGU	Influence of elastic strains on conductivity, thermal EMF and magnetic structure of ferromagnetics (with L'vova)

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<u>Name</u>	<u>Year</u>	<u>Institution</u>	<u>Subject</u>
Ye. I. Kondorskiy	1958		Anisotropy in weak fields
L. M. L'vova	1958	MGU	Influence of elastic strains on conductivity, thermal EMF, and magnetic structure of ferromagnetics (with Khramov)
Puzey	1946	MGU	Determined constant K for the alloys NiCu, NiSn, and NiMo at various temperatures
Ya. S. Shur	1958	Ural MTI	Experimented on disc crystals of silicon steel and obtained curves showing relation between coercive force and direction of magnetization
Ya. S. Shur	1940		Influence of magnetic field and elastic strains applied during heat treatment on coercive force of crystals
Ya. S. Shur	1940		Magnetic texture of specimens annealed in a state of strain (with Emokhlov)
K. V. Vladimirovskiy	1940		Formulas for magnetic structure of a polycrystalline body during saturation
D. I. Volkov	1957	MGU	Influence of elastic strains on conductivity, thermal EMF, and magnetic structure of ferromagnetics
S. V. Venkovskiy	1958		Calculation of relation between temperature and magnetic anisotropy of cobalt crystals
S. V. Venkovskiy	1959		Formulas for coercive force of monocrystalline discs

III. WORK ON STUDY OF MAGNETIC STRUCTURE OF FERROMAGNETICS

N. S. Akulov	1951	Magnetic forces in demagnetized iron crystals (with Dekhtyar)
M. V. Dekhtyar	1951	Magnetic forces in demagnetized iron crystals (with Akulov)

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<u>Name</u>	<u>Year</u>	<u>Institution</u>	<u>Subject</u>
L. G. Dorfman	1930		Relation between area of spontaneous magnetization and surface energy (with Frenkel')
Ya. I. Frenkel'	1930		Relation between area of spontaneous magnetization and surface energy (with Dorfman)
L. D. Landau	1935		Alteration in direction of magnetic moment across the boundary zone (with Lifshits)
Ye. M. Lifshits	1935		Alteration in direction of magnetic moment across the boundary zone (with Landau)
M. Ya. Shirokobekov	1945	GIFTI	Magnetic structure of nonaxial ferromagnetics
S. V. Vonskovskiy	1942	Ural PTI	Theory of magnetic structure of a triaxial crystal

**IV. WORK ON THEORY OF MAGNETIZATION AT WEAK AND MODERATE INDUCTIONS
AND SUSCEPTIBILITY**

Ye. I. Komorskiy	1937		Nature of irreversible changes in magnetization
Ye. I. Komorskiy	1938		Formulas for reversible susceptibility of cubical system crystals and polycrystalline bodies
Ye. I. Komorskiy	1939		Experiments on effect of strains on coercive force and the influence of the initial state on susceptibility
Ye. I. Komorskiy	1940		Causes of hysteresis of ferromagnetics
S. V. Vonskovskiy	1939		Effect of magnetic field and elastic strains occurring during heat treatment on magnetization curves and anisotropy of coercive force of crystals
S. V. Vonskovskiy	1942	Ural PTI	Reversible susceptibility in isotropic polycrystalline specimens

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V. WORK ON THEORY OF POLYCRYSTALLINE FERROMAGNETICS

Name	Year	Institution	Subject
L. A. Chernikova	1946		Hysteresis curves of polycrystalline ferromagnetics (with Poptsov)
Ye. I. Konorskiy	1942		Theory of a polycrystalline ferromagnetic with monocristalline crystal grains of arbitrary shape
N. P. Poptsov	1945		Hysteresis curves of polycrystalline ferromagnetics (with Chernikova)

VI. WORK ON INVESTIGATION OF MAGNETIC PROPERTIES OF FERROMAGNETICS
IN APERIODIC AND PERIODIC FIELDS

I. V. Antik	1951	Calculation of resistance-current curves for iron wires
V. K. Armand'yev	1951	Inserting the term μH in Maxwell's Equation
V. K. Armand'yev	1956	Decrease of permeability in high-frequency alternating fields
V. K. Armand'yev	1956	General method of calculating magnetic characteristics of ferromagnetics in alternating and aperiodic fields
V. M. Goytannikov	1959	Measurement of magnetic viscosity (with Voletskaya)
L. D. Landau	1955	Disturbance of grains between zones of spontaneous magnetization in alternating fields (with Lifshits)
Ye. M. Lifshits	1955	Disturbance of grains between zones of spontaneous magnetization in alternating fields (with Landau)
K. M. Polivanov	1940-41	General theory of influence of magnetic structure on decrease in magnetic permeability and on skin-effect phenomena in alternating fields
K. M. Polivanov	1942	Theory of skin effect in ferromagnetics

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<u>Name</u>	<u>Year</u>	<u>Institution</u>	<u>Subject</u>
B. A. Sadikov	1930		Experimental study of relation between resistance and tension of iron wires
P. V. Telesmin	1937-39		Magnetic viscosity of steep portions of hysteresis loops
A. N. Tikhonov	1937		Magnetization of a cylinder and a disc, taking account of magnetic viscosity
O. I. Veletskaya	1936		Measurement of magnetic viscosity
O. I. Veletskaya	1939		Measurement of magnetic viscosity (with Goytannikov)
K. A. Volkova	1932		Relation between coefficients n and p and frequency
B. A. Vvedenskiy	1921-25		Magnetization of a cylinder in aperiodic and periodic fields
Yermolayev	1929		Experimental determination of resistance-current curves for iron wires

VII. WORK ON PRODUCTION OF MAGNETIC MATERIALS

Gabrielyan	1941-45	TsNIIchernet	Alloys with high initial and maximum permeability
D. A. Gringaus	1957		Influence of composition and heat treatment on the magnetic properties of iron-nickel-aluminum alloys (with Livshits)
L. T. Kazarnovskiy	1957		Transformer steel (with Zaymovskiy)
L. T. Kazarnovskiy	1958		Transformer steel (with Nashobkin and Zaymovskiy)
Ye. I. Kondorevskiy	1952		Transformer steel (with Zaymovskiy)
B. G. Livshits	1957-61	TsNII of ATB	Influence of composition and heat treatment on the magnetic properties of iron-nickel-aluminum alloys (with Gringaus)
B. G. Livshits	1941-45		Iron-nickel-cobalt-aluminum alloys with high residual induction figures and coercive force (with Zaymovskiy)

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<u>Name</u>	<u>Year</u>	<u>Institution</u>	<u>Subject</u>
V. S. Mes'kin	1935	Leningrad Steel Insti	Influence of grain size on magnetic permeability and coercive force of iron
K. V. Nashchekin	1938		Transformer steel (with Kafarnovskiy and Zaymovskiy)
Ye. P. Ostrovskiy	1933		Transformer steel (with Zaymovskiy)
Ya. P. Solisskiy	1941	VEI	Permeability, coercive force, and magnetostructure of iron, silicon and aluminum alloys
V. V. Usov	1941		Transformer steel (with Zaymovskiy)
A. S. Zaymovskiy	1930-41	VEI Moscow	Methods of improving transformer steel (with Kafarnovskiy, Kondorskiy, Nashchekin, Ostrovskiy, Usov)
A. S. Zaymovskiy	1941-45		Iron-nickel-cobalt-aluminum alloys with high residual induction and coercive force (with Livshits) "Magniko" alloy

VIII. MAGNETIC TESTING (CRACK DETECTING, ETC.)

<u>Name</u>	<u>Year</u>	<u>Institution</u>	<u>Subject</u>
Akimov		VIAM	Magnetic testing
N. S. Akimov		NIIF MGU TMIIT Mash	Magnetic testing
V. K. Arkad'yev	1937	NIIF MGU	Theory of magnetic testing
M. V. Dekhtyar		NIIF MGU	Magnetic testing
Makilov		UFAN	Magnetic testing
Origorov		UFAN	Magnetic testing
Khaliloye		UFAN	Magnetic testing
Ye. I. Kondorskiy		NIIF MGU	Magnetic testing
Inbyshkin		VIAM	Magnetic testing
Mitheyev		UFAN	Magnetic testing
Rozhestvenskiy		VIAM	Magnetic testing
Shrayber		VIAM	Magnetic testing
Ya. S. Shar		UFAN	Magnetic testing

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Sigolayer		TaNIIT Mash	Magnetic testing
S. V. Vonskovskiy		UFAN	Magnetic testing
R. I. Yams	1958-56	UFAN	Theory of magnetic testing
Yeremiz		TaNIIT Mash	Magnetic testing
Zhigadlo		VIAM	Magnetic testing

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